



SEQUENCE LISTING

Bower, Benjamin S.
Fowler, Timothy
Phillips, Jay I.

<120> Novel EGIIII-Like Enzymes, DNA Encoding
Such Enzymes and Methods for Producing Such Enzymes

<130> GC516-2-US

<140> US 09/284,327

<141> 1999-04-10

<150> PCT/US98/26552

<151> 1998-12-14

<160> 68

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<221> VARIANT

<222> 3

<223> Xaa = Leu, Phe, Lys, or Ile

<400> 1

Asn Asn Xaa Trp Gly

1

5

<210> 2

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<221> VARIANT

<222> 2

<223> Xaa = Leu, Phe, or Ile

<400> 2

Glu Xaa Met Ile Trp

1

5

<210> 3

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 3

Gly Thr Glu Pro Phe Thr

1 5

<210> 4

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 4

Ser Val Lys Ser Tyr

1 5

<210> 5

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> synthetic

<400> 5

Lys Asn Phe Phe Asn Tyr

1 5

<210> 6

<211> 702

<212> DNA

<213> Trichoderma reesei

<400> 6

atgaagttcc ttcaagtcct ccctgccctc ataccggcgc ccctggccca aaccagctgt 60
gaccagtggg caaccttcac tggcaacggc tacacagtca gcaacaacct ttggggagca 120
tcagccgggt ctggatttgg ctgcgtgacg gcggtatcgc tcagcggcgg ggcctcctgg 180
cacgcagact ggcagtgggtc cggcggccag aacaacgtca agtcgtacca gaactctcag 240
attgccattc cccagaagag gaccgtcaac agcatcagca gcatgcccac cactgccagc 300
tggagctaca gcgggagcaa catccgcgct aatggttgcgt atgacttggt caccgcagcc 360
aaccggaatc atgtcacgta ctcgggagac tacgaactca tgatctggct tggcaaatac 420
ggcgatattg ggccgattgg gtcctcacag ggaacagtca acgtcgggtg ccagagctgg 480
acgctctact atggctacaa cggagccatg caagtctatt cctttgtggc ccagaccaac 540
actaccaact acagcggaga tgtcaagaac ttcttcaatt atctccgaga caataaagga 600
tacaacgctg caggccaata tgttcttagc taccaatttg gtaccgagcc cttcacgggc 660
agtggaactc tgaacgtcgc atcctggacc gcatctatca ac 702

<210> 7

<211> 232

<212> PRT

<213> Trichoderma reesei

<400> 7

Met Lys Phe Leu Gln Val Leu Pro Ala Leu Ile Pro Ala Ala Leu Ala

1 5 10 15

Gln Thr Ser Cys Asp Gln Trp Ala Thr Phe Thr Gly Asn Gly Tyr Thr

20 25 30

Val Ser Asn Asn Leu Trp Gly Ala Ser Ala Gly Ser Gly Phe Gly Cys

35 40 45

Val	Thr	Ala	Val	Ser	Leu	Ser	Gly	Gly	Ala	His	Ala	Asp	Trp	Gln	Trp
50						55					60				
Ser	Gly	Gly	Gln	Asn	Asn	Val	Lys	Ser	Tyr	Gln	Asn	Ser	Gln	Ile	Ala
65					70					75					80
Ile	Pro	Gln	Lys	Arg	Thr	Val	Asn	Ser	Ile	Ser	Ser	Met	Pro	Thr	Thr
				85					90					95	
Ala	Ser	Trp	Ser	Tyr	Ser	Gly	Ser	Asn	Ile	Arg	Ala	Asn	Val	Ala	Tyr
			100					105					110		
Asp	Leu	Phe	Thr	Ala	Ala	Asn	Pro	Asn	His	Val	Thr	Tyr	Ser	Gly	Asp
		115					120					125			
Tyr	Glu	Leu	Met	Ile	Trp	Leu	Gly	Lys	Tyr	Gly	Asp	Ile	Gly	Pro	Ile
	130					135					140				
Gly	Ser	Ser	Gln	Gly	Thr	Val	Asn	Val	Gly	Gly	Gln	Ser	Trp	Thr	Leu
145					150					155					160
Tyr	Tyr	Gly	Tyr	Asn	Gly	Ala	Met	Gln	Val	Tyr	Ser	Phe	Val	Ala	Gln
				165					170					175	
Thr	Asn	Thr	Thr	Asn	Tyr	Ser	Gly	Asp	Val	Lys	Asn	Phe	Phe	Asn	Tyr
			180					185					190		
Leu	Arg	Asp	Asn	Lys	Gly	Tyr	Asn	Ala	Ala	Gly	Gln	Tyr	Val	Leu	Ser
		195					200				205				
Tyr	Gln	Phe	Gly	Thr	Glu	Pro	Phe	Thr	Gly	Ser	Gly	Thr	Leu	Asn	Val
	210					215					220				
Ala	Ser	Trp	Thr	Ala	Ser	Ile	Asn								
225					230										

<210> 8

<211> 234

<212> PRT

<213> Trichoderma reesei

<400> 8

Met	Lys	Phe	Leu	Gln	Val	Leu	Pro	Ala	Leu	Ile	Pro	Ala	Ala	Leu	Ala
1			5						10					15	
Gln	Thr	Ser	Cys	Asp	Gln	Trp	Ala	Thr	Phe	Thr	Gly	Asn	Gly	Tyr	Thr
			20					25					30		
Val	Ser	Asn	Asn	Leu	Trp	Gly	Ala	Ser	Ala	Gly	Ser	Gly	Phe	Gly	Cys
		35					40					45			
Val	Thr	Ala	Val	Ser	Leu	Ser	Gly	Gly	Ala/Ser	Trp	His	Ala	Asp	Trp	
	50					55				60					
Gln	Trp	Ser	Gly	Gly	Gln	Asn	Asn	Val	Lys	Ser	Tyr	Gln	Asn	Ser	Gln
65					70					75				80	
Ile	Ala	Ile	Pro	Gln	Lys	Arg	Thr	Val	Asn	Ser	Ile	Ser	Ser	Met	Pro
				85					90					95	
Thr	Thr	Ala	Ser	Trp	Ser	Tyr	Ser	Gly	Ser	Asn	Ile	Arg	Ala	Asn	Val
			100					105					110		
Ala	Tyr	Asp	Leu	Phe	Thr	Ala	Ala	Asn	Pro	Asn	His	Val	Thr	Tyr	Ser
		115					120				125				
Gly	Asp	Tyr	Glu	Leu	Met	Ile	Trp	Leu	Gly	Lys	Tyr	Gly	Asp	Ile	Gly
	130					135					140				
Pro	Ile	Gly	Ser	Ser	Gln	Gly	Thr	Val	Asn	Val	Gly	Gly	Gln	Ser	Trp
145					150					155					160
Thr	Leu	Tyr	Tyr	Gly	Tyr	Asn	Gly	Ala	Met	Gln	Val	Tyr	Ser	Phe	Val
				165					170					175	
Ala	Gln	Thr	Asn	Thr	Thr	Asn	Tyr	Ser	Gly	Asp	Val	Lys	Asn	Phe	Phe
			180					185					190		
Asn	Tyr	Leu	Arg	Asp	Asn	Lys	Gly	Tyr	Asn	Ala	Ala	Gly	Gln	Tyr	Val
		195				200						205			
Leu	Ser	Tyr	Gln	Phe	Gly	Thr	Glu	Pro	Phe	Thr	Gly	Ser	Gly	Thr	Leu
	210					215					220				
Asn	Val	Ala	Ser	Trp	Thr	Ala	Ser	Ile	Asn						
225					230										

<210> 9
 <211> 234
 <212> PRT
 <213> Hypocrea schweinitzii

<400> 9
 Met Lys Phe Leu Gln Val Leu Pro Ala Ile Leu Pro Ala Ala Leu Ala
 1 5 10 15
 Gln Thr Ser Cys Asp Gln Tyr Ala Thr Phe Ser Gly Asn Gly Tyr Ile
 20 25 30
 Val Ser Asn Asn Leu Trp Gly Ala Ser Ala Gly Ser Gly Phe Gly Cys
 35 40 45
 Val Thr Ser Val Ser Leu Asn Gly Ala Ala Ser Trp His Ala Asp Trp
 50 55 60
 Gln Trp Ser Gly Gly Gln Asn Asn Val Lys Ser Tyr Gln Asn Val Gln
 65 70 75 80
 Ile Asn Ile Pro Gln Lys Arg Thr Val Asn Ser Ile Gly Ser Met Pro
 85 90 95
 Thr Thr Ala Ser Trp Ser Tyr Ser Gly Ser Asp Ile Arg Ala Asn Val
 100 105 110
 Ala Tyr Asp Leu Phe Thr Ala Ala Asn Pro Asn His Val Thr Tyr Ser
 115 120 125
 Gly Asp Tyr Glu Leu Met Ile Trp Leu Gly Lys Tyr Gly Asp Ile Gly
 130 135 140
 Pro Ile Gly Ser Ser Gln Gly Thr Val Asn Val Gly Gly Gln Thr Trp
 145 150 155 160
 Thr Leu Tyr Tyr Gly Tyr Asn Gly Ala Met Gln Val Tyr Ser Phe Val
 165 170 175
 Ala Gln Ser Asn Thr Thr Ser Tyr Ser Gly Asp Val Lys Asn Phe Phe
 180 185 190
 Asn Tyr Leu Arg Asp Asn Lys Gly Tyr Asn Ala Gly Gly Gln Tyr Val
 195 200 205
 Leu Ser Tyr Gln Phe Gly Thr Glu Pro Phe Thr Gly Ser Gly Thr Leu
 210 215 220
 Asn Val Ala Ser Trp Thr Ala Ser Ile Asn
 225 230

<210> 10
 <211> 259
 <212> PRT
 <213> Aspergillus aculeatus

<400> 10
 Met Lys Ala Phe His Leu Leu Ala Ala Leu Ala Gly Ala Ala Val Ala
 1 5 10 15
 Gln Gln Ala Gln Leu Cys Asp Gln Tyr Ala Thr Tyr Thr Gly Gly Val
 20 25 30
 Tyr Thr Ile Asn Asn Asn Leu Trp Gly Lys Asp Ala Gly Ser Gly Ser
 35 40 45
 Gln Cys Thr Thr Val Asn Ser Ala Ser Ser Ala Gly Thr Ser Trp Ser
 50 55 60
 Thr Lys Trp Asn Trp Ser Gly Gly Glu Asn Ser Val Lys Ser Tyr Ala
 65 70 75 80
 Asn Ser Gly Leu Thr Phe Asn Lys Lys Leu Val Ser Gln Ile Ser Gln
 85 90 95
 Ile Pro Thr Thr Ala Arg Trp Ser Tyr Asp Asn Thr Gly Ile Arg Ala
 100 105 110
 Asp Val Ala Tyr Asp Leu Phe Thr Ala Ala Asp Ile Asn His Val Thr
 115 120 125
 Trp Ser Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr Gly Gly

130		135		140											
Val	Gln	Pro	Ile	Gly	Ser	Gln	Ile	Ala	Thr	Ala	Thr	Val	Asp	Gly	Gln
145					150					155					160
Thr	Trp	Glu	Leu	Trp	Tyr	Gly	Ala	Asn	Gly	Ser	Gln	Lys	Thr	Tyr	Ser
				165						170				175	
Phe	Val	Ala	Pro	Thr	Pro	Ile	Thr	Ser	Phe	Gln	Gly	Asp	Val	Asn	Asp
			180					185				190			
Phe	Phe	Lys	Tyr	Leu	Thr	Gln	Asn	His	Gly	Phe	Pro	Ala	Ser	Ser	Gln
		195					200				205				
Tyr	Leu	Ile	Thr	Leu	Gln	Phe	Gly	Thr	Glu	Pro	Phe	Thr	Gly	Gly	Pro
	210					215					220				
Ala	Thr	Leu	Ser	Val	Ser	Asn	Trp	Ser	Ala	Ser	Val	Gln	Gln	Ala	Gly
225					230					235				240	
Phe	Glu	Pro	Trp	Gln	Asn	Gly	Ala	Gly	Leu	Ala	Val	Asn	Ser	Phe	Ser
				245				250						255	
Ser	Thr	Val													

<210> 11
 <211> 239
 <212> PRT
 <213> Aspergillus kawachii (1)

<400> 11
Met Lys Leu Ser Met Thr Leu Ser Leu Phe Ala Ala Thr Ala Met Gly
1 5 10 15
Gln Thr Met Cys Ser Gln Tyr Asp Ser Ala Ser Ser Pro Pro Tyr Ser
20 25 30
Val Asn Gln Asn Leu Trp Gly Glu Tyr Gln Gly Thr Gly Ser Gln Cys
35 40 45
Val Tyr Val Asp Lys Leu Ser Ser Ser Gly Ala Ser Trp His Thr Lys
50 55 60
Trp Thr Trp Ser Gly Gly Glu Gly Thr Val Lys Ser Tyr Ser Asn Ser
65 70 75 80
Gly Leu Thr Phe Asp Lys Lys Leu Val Ser Asp Val Ser Ser Ile Pro
85 90 95
Thr Ser Val Thr Trp Ser Gln Asp Asp Thr Asn Val Gln Ala Asp Val
100 105 110
Ser Tyr Asp Leu Phe Thr Ala Ala Asn Ala Asp His Ala Thr Ser Ser
115 120 125
Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr Gly Ser Val Gln
130 135 140
Pro Ile Gly Lys Gln Ile Ala Thr Ala Thr Val Gly Gly Lys Ser Trp
145 150 155 160
Glu Val Trp Tyr Gly Thr Ser Thr Gln Ala Gly Ala Glu Gln Lys Thr
165 170 175
Tyr Ser Phe Val Ala Gly Ser Pro Ile Asn Ser Trp Ser Gly Asp Ile
180 185 190
Lys Asp Phe Phe Asn Tyr Leu Thr Gln Asn Gln Gly Phe Pro Ala Ser
195 200 205
Ser Gln His Leu Ile Thr Leu Gln Cys Gly Thr Glu Pro Phe Thr Gly
210 215 220
Gly Pro Ala Thr Phe Thr Val Asp Asn Trp Thr Ala Ser Val Asn
225 230 235

<210> 12
 <211> 239
 <212> PRT
 <213> Aspergillus kawachii (2)

<400> 12

Met Lys Ala Phe His Leu Leu Ala Ala Leu Ser Gly Ala Ala Val Ala
 1 5 10 15
 Gln Gln Ala Gln Leu Cys Asp Gln Tyr Ala Thr Tyr Thr Gly Gly Val
 20 25 30
 Tyr Thr Ile Asn Asn Asn Leu Trp Gly Lys Asp Ala Gly Ser Gly Ser
 35 40 45
 Gln Cys Thr Thr Val Asn Ser Ala Ser Ser Ala Gly Thr Ser Trp Ser
 50 55 60
 Thr Lys Trp Asn Trp Ser Gly Gly Glu Asn Ser Val Lys Ser Tyr Ala
 65 70 75 80
 Asn Ser Gly Leu Ser Phe Asn Lys Lys Leu Val Ser Gln Ile Ser His
 85 90 95
 Ile Pro Thr Ala Arg Trp Ser Tyr Asp Asn Thr Cys Ile Arg Arg
 100 105 110
 Gly Arg Ala Tyr Asp Leu Phe Thr Ala Ala Asp Ile Asn His Val Thr
 115 120 125
 Trp Ser Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr Gly Gly
 130 135 140
 Val Gln Pro Leu Gly Ser Gln Ile Ala Thr Ala Thr Val Glu Gly Gln
 145 150 155 160
 Thr Trp Glu Leu Trp Tyr Gly Val Asn Gly Ala Gln Lys Thr Tyr Ser
 165 170 175
 Phe Val Ala Ala Asn Pro Ile Thr Ser Phe Gln Gly Asp Ile Asn Asp
 180 185 190
 Phe Phe Lys Tyr Leu Thr Gln Asn His Gly Phe Pro Ala Ser Ser Gln
 195 200 205
 Tyr Leu Ile Ile Leu Ala Leu Gln Phe Gly Thr Glu Pro Phe Thr Gly
 210 215 220
 Gly Pro Ala Thr Leu Asn Val Ala Asp Trp Ser Ala Ser Val Gln
 225 230 235

<210> 13

<211> 247

<212> PRT

<213> *Aspergillus oryzae*

<400> 13

Met Lys Leu Ser Leu Ala Leu Ala Thr Leu Val Ala Thr Ala Phe Ser
 1 5 10 15
 Gln Glu Leu Cys Ala Gln Tyr Asp Ser Ala Ser Ser Pro Pro Tyr Ser
 20 25 30
 Val Asn Asn Asn Leu Trp Gly Gln Asp Ser Gly Thr Gly Phe Thr Ser
 35 40 45
 Gln Cys Val Tyr Val Asp Asn Leu Ser Ser Ser Gly Ala Ala Trp His
 50 55 60
 Thr Thr Trp Thr Trp Asn Gly Gly Glu Gly Ser Val Lys Ser Tyr Ser
 65 70 75 80
 Asn Ser Ala Val Thr Phe Asp Lys Lys Leu Val Ser Asp Val Gln Ser
 85 90 95
 Ile Pro Thr Asp Val Glu Trp Ser Gln Asp Phe Thr Asn Thr Asn Val
 100 105 110
 Asn Ala Asp Val Ala Tyr Asp Leu Phe Thr Ala Ala Asp Gln Asn His
 115 120 125
 Val Thr Tyr Ser Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr
 130 135 140
 Gly Thr Ile Gln Pro Ile Gly Thr Gln Ile Asp Thr Ala Thr Val Glu
 145 150 155 160
 Gly His Thr Trp Glu Leu Trp Phe Thr Tyr Gly Thr Thr Ile Gln Ala
 165 170 175
 Gly Ala Glu Gln Lys Thr Tyr Ser Phe Val Ser Ala Thr Pro Ile Asn
 180 185 190

Thr Phe Gly Gly Asp Ile Lys Lys Phe Phe Asp Tyr Ile Thr Ser Lys
 195 200 205
 His Ser Phe Pro Ala Ser Ala Gln Tyr Leu Ile Asn Met Gln Phe Gly
 210 215 220
 Thr Glu Pro Phe Phe Thr Thr Gly Gly Pro Val Thr Phe Thr Val Pro
 225 230 235 240
 Asn Trp Thr Ala Ser Val Asn
 245

<210> 14
 <211> 254
 <212> PRT
 <213> Humicola grisei

<400> 14
 Met Leu Lys Ser Ala Leu Leu Leu Gly Ala Ala Ala Val Ser Val Gln
 1 5 10 15
 Ser Ala Ser Ile Pro Thr Ile Pro Ala Asn Leu Glu Pro Arg Gln Ile
 20 25 30
 Arg Ser Leu Cys Glu Leu Tyr Gly Tyr Trp Ser Gly Asn Gly Tyr Glu
 35 40 45
 Leu Leu Asn Asn Leu Trp Gly Lys Asp Thr Ala Thr Ser Gly Trp Gln
 50 55 60
 Cys Thr Tyr Leu Asp Gly Thr Asn Asn Gly Gly Ile Gln Trp Asn Thr
 65 70 75 80
 Ala Trp Glu Trp Gln Gly Ala Pro Asp Asn Val Lys Asn Tyr Pro Tyr
 85 90 95
 Val Gly Lys Gln Ile Gln Arg Gly Arg Lys Ile Ser Asp Ile Asn Ser
 100 105 110
 Met Arg Thr Ser Val Ser Trp Thr Tyr Asp Arg Thr Asp Leu Arg Ala
 115 120 125
 Asn Val Ala Tyr Asp Val Phe Thr Ala Arg Asp Pro Asp His Pro Asn
 130 135 140
 Trp Gly Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr Gly Gly
 145 150 155 160
 Ile Tyr Pro Ile Gly Thr Phe His Ser Gln Val Asn Leu Ala Gly Arg
 165 170 175
 Thr Trp Asp Leu Trp Thr Gly Tyr Asn Gly Asn Met Arg Val Tyr Ser
 180 185 190
 Phe Leu Pro Pro Ser Gly Asp Ile Arg Asp Phe Ser Cys Asp Ile Lys
 195 200 205
 Asp Phe Phe Asn Tyr Leu Glu Arg Asn His Gly Tyr Pro Ala Arg Glu
 210 215 220
 Gln Asn Leu Ile Val Tyr Gln Val Gly Thr Glu Cys Phe Thr Gly Gly
 225 230 235 240
 Pro Ala Arg Phe Thr Cys Arg Asp Phe Arg Ala Asp Leu Trp
 245 250

<210> 15
 <211> 254
 <212> PRT
 <213> Humicola insolens

<400> 15
 Met Leu Lys Ser Ala Leu Leu Leu Gly Pro Ala Ala Val Ser Val Gln
 1 5 10 15
 Ser Ala Ser Ile Pro Thr Ile Pro Ala Asn Leu Glu Pro Arg Gln Ile
 20 25 30
 Arg Ser Leu Cys Glu Leu Tyr Gly Tyr Trp Ser Gly Asn Gly Tyr Glu
 35 40 45
 Leu Leu Asn Asn Leu Trp Gly Lys Asp Thr Ala Thr Ser Gly Trp Gln

50		55		60
Cys Thr Tyr Leu Asp Gly	Thr Asn Asn Gly Gly	Ile Gln Trp Ser Thr		
65	70	75	80	
Ala Trp Glu Trp Gln Gly	Ala Pro Asp Asn Val Lys Ser Tyr Pro Tyr			
	85	90	95	
Val Gly Lys Gln Ile Gln Arg Gly Arg	Lys Ile Ser Asp Ile Asn Ser			
	100	105	110	
Met Arg Thr Ser Val Ser Trp Thr Tyr Asp Arg Thr Asp Ile Arg Ala				
	115	120	125	
Asn Val Ala Tyr Asp Val Phe Thr Ala Arg Asp Pro Asp His Pro Asn				
	130	135	140	
Trp Gly Gly Asp Tyr Glu Leu Met Ile Trp Leu Ala Arg Tyr Gly Gly				
145	150	155	160	
Ile Tyr Pro Ile Gly Thr Phe His Ser Gln Val Asn Leu Ala Gly Arg				
	165	170	175	
Thr Trp Asp Leu Trp Thr Gly Tyr Asn Gly Asn Met Arg Val Tyr Ser				
	180	185	190	
Phe Leu Pro Pro Ser Gly Asp Ile Arg Asp Phe Ser Cys Asp Ile Lys				
	195	200	205	
Asp Phe Phe Asn Tyr Leu Glu Arg Asn His Gly Tyr Pro Ala Arg Glu				
	210	215	220	
Gln Asn Leu Ile Val Tyr Gln Val Gly Thr Glu Cys Phe Thr Gly Gly				
225	230	235	240	
Pro Ala Arg Phe Thr Cys Arg Asp Phe Arg Ala Asp Leu Trp				
	245	250		

<210> 16
 <211> 247
 <212> PRT
 <213> Chaetomium brasiliense

<400> 16
Met Lys Leu Thr Leu Val Leu Phe Val Ser Ser Leu Ala Ala Ala Thr
1 5 10 15
Pro Leu Gly Trp Arg Glu Arg Gln Gln Val Ser Leu Cys Gly Gln
20 25 30
Ser Ser Ser Trp Ser Gly Asn Gly Tyr Gln Leu Asn Asn Asn Leu Trp
35 40 45
Gly Gln Ser Arg Ala Thr Ser Gly Ser Gln Cys Thr Tyr Leu Asp Ser
50 55 60
Ser Ser Asn Ser Gly Ile His Trp His Thr Thr Trp Thr Trp Glu Gly
65 70 75 80
Gly Glu Gly Glu Val Lys Ser Tyr Ala Tyr Ser Gly Arg Gln Val Ser
85 90 95
Thr Gly Leu Thr Ile Ala Ser Ile Asp Ser Met Gln Thr Ser Val Ser
100 105 110
Trp Glu Tyr Asn Thr Thr Asp Ile Gln Ala Asn Val Ala Tyr Asp Ile
115 120 125
Phe Thr Ala Glu Asp Pro Asp His Glu His Ser Ser Gly Asp Tyr Glu
130 135 140
Leu Met Ile Trp Leu Ala Arg Tyr Asn Asn Val Ser Pro Ile Gly Ser
145 150 155 160
Ser Val Ala Thr Ala Thr Val Gly Gly Asp Thr Trp Asp Leu Phe Ala
165 170 175
Gly Ala Asn Gly Asp Met Glu Val Tyr Ser Phe Val Ala Glu Asn Thr
180 185 190
Met Asn Ser Phe Ser Gly Asp Val Lys Asp Phe Phe Asp Tyr Leu Glu
195 200 205
Gln Asn Val Gly Phe Pro Val Asp Asp Gln Tyr Leu Leu Val Phe Glu
210 215 220
Leu Gly Ser Glu Ala Phe Thr Gly Gly Pro Ala Thr Leu Ser Val Ser

225 230
Gln Phe Ser Ala Asn Ile Ala
 245

235

240

<210> 17
<211> 238
<212> PRT
<213> Fusarium equseti

<400> 17
Met Lys Ser Thr Leu Leu Leu Ala Gly Ala Phe Ala Pro Leu Ala Phe
1 5 10 15
Ala Lys Asp Leu Cys Glu Gln Tyr Gly Tyr Leu Ser Ser Asp Gly Tyr
 20 25 30
Ser Leu Asn Asn Asn Val Trp Gly Lys Asp Ser Gly Thr Gly Asp Gln
 35 40 45
Cys Thr His Val Asn Trp Asn Asn Ala Asn Gly Ala Gly Trp Asp Val
 50 55 60
Glu Trp Asn Trp Ser Gly Gly Lys Asp Asn Val Lys Ser Tyr Pro Asn
65 70 75 80
Ser Ala Leu Leu Ile Gly Glu Asp Lys Lys Thr Ile Ser Ser Ile Thr
 85 90 95
Asn Met Gln Ser Thr Ala Glu Trp Lys Tyr Ser Gly Asp Asn Leu Arg
 100 105 110
Ala Asp Val Ala Tyr Asp Leu Phe Thr Ala Ala Asp Pro Asn His Glu
 115 120 125
Thr Ser Ser Gly Glu Tyr Glu Leu Met Val Trp Leu Ala Arg Ile Gly
130 135 140
Gly Val Gln Pro Ile Gly Ser Leu Gln Thr Ser Val Thr Ile Glu Gly
145 150 155 160
His Thr Trp Glu Leu Trp Val Gly Met Asn Gly Ser Met Lys Val Phe
 165 170 175
Ser Phe Val Ala Pro Thr Pro Val Asn Asn Phe Asn Ala Asp Ile Lys
 180 185 190
Gln Phe Trp Asp Tyr Leu Thr Lys Ser Gln Asn Phe Pro Ala Asp Asn
195 200 205
Gln Tyr Leu Leu Thr Phe Gln Phe Gly Thr Glu Pro Phe Thr Gly Asp
210 215 220
Asn Ala Lys Phe Thr Val Thr Asn Phe Asn Ala His Leu Lys
225 230 235

<210> 18
<211> 244
<212> PRT
<213> Fusarium javanicum (1)

<400> 18
Met Lys Ser Ala Ile Val Ala Ala Leu Ala Gly Leu Ala Ala Ala Ser
1 5 10 15
Pro Thr Arg Leu Ile Pro Arg Gly Gln Phe Cys Gly Gln Trp Asp Ser
 20 25 30
Glu Thr Ala Gly Ala Tyr Thr Ile Tyr Asn Asn Leu Trp Gly Lys Asp
 35 40 45
Asn Ala Glu Ser Gly Glu Gln Cys Thr Thr Asn Ser Gly Glu Gln Ser
50 55 60
Asp Gly Ser Ile Ala Trp Ser Val Glu Trp Ser Trp Thr Gly Gly Gln
65 70 75 80
Gly Gln Val Lys Ser Tyr Pro Asn Ala Val Val Glu Ile Glu Lys Lys
 85 90 95
Thr Leu Gly Glu Val Ser Ser Ile Pro Ser Ala Trp Asp Trp Thr Tyr
 100 105 110

Thr Gly Asn Gly Ile Ile Ala Asn Val Ala Tyr Asp Leu Phe Thr Ser
 115 120 125
 Ser Thr Glu Ser Gly Asp Ala Glu Tyr Glu Phe Met Ile Trp Leu Ser
 130 135 140
 Ala Leu Gly Gly Ala Gly Pro Ile Ser Asn Asp Gly Ser Pro Val Ala
 145 150 155 160
 Thr Ala Glu Leu Ala Gly Thr Ser Trp Lys Leu Tyr Gln Gly Lys Asn
 165 170 175
 Asn Gln Met Thr Val Phe Ser Phe Val Ala Glu Ser Asp Val Asn Asn
 180 185 190
 Phe Cys Gly Asp Leu Ala Asp Phe Thr Asp Tyr Leu Val Asp Asn His
 195 200 205
 Gly Val Ser Ser Ser Gln Ile Leu Gln Ser Val Gly Ala Gly Thr Glu
 210 215 220
 Pro Phe Glu Gly Thr Asn Ala Val Phe Thr Thr Asn Asn Tyr His Ala
 225 230 235 240
 Asp Val Glu Tyr

<210> 19
 <211> 250
 <212> PRT
 <213> Fusarium javanicum (2)

<400> 19
 Met Lys Phe Phe Gly Val Val Ser Ala Ser Leu Ala Ala Thr Ala Val
 1 5 10 15
 Ala Thr Pro Thr Thr Pro Thr Glu Thr Ile Glu Lys Arg Asp Thr Thr
 20 25 30
 Trp Cys Asp Ala Phe Gly Ser Leu Ala Thr Ser Gly Tyr Thr Val Tyr
 35 40 45
 His Asn Asn Trp Gly Lys Gly Asp Ala Thr Ser Gly Ser Gln Cys Thr
 50 55 60
 Thr Phe Thr Ser Val Ser Asn Asn Asn Phe Val Trp Ser Thr Ser Trp
 65 70 75 80
 Thr Trp Ala Gly Gly Ala Gly Lys Val Lys Ser Tyr Ser Asn Val Ala
 85 90 95
 Leu Glu Lys Ile Asn Lys Lys Ile Ser Asp Ile Lys Ser Val Ser Thr
 100 105 110
 Arg Trp Ile Trp Arg Tyr Thr Gly Thr Lys Met Ile Ala Asn Val Ser
 115 120 125
 Tyr Asp Leu Trp Phe Ala Pro Thr Ala Ser Ser Asn Asn Ala Tyr Glu
 130 135 140
 Ile Met Ile Trp Val Gly Ala Tyr Gly Gly Ala Leu Pro Ile Ser Thr
 145 150 155 160
 Pro Gly Lys Gly Val Ile Asp Arg Pro Thr Leu Ala Gly Ile Pro Trp
 165 170 175
 Asp Val Tyr Lys Gly Pro Asn Gly Asp Val Thr Val Ile Ser Phe Val
 180 185 190
 Ala Ser Ser Asn Gln Gly Asn Phe Gln Ala Asp Leu Lys Glu Phe Leu
 195 200 205
 Asn Tyr Leu Thr Ser Lys Gln Gly Leu Pro Ser Asn Tyr Val Ala Thr
 210 215 220
 Ser Phe Gln Ala Gly Thr Glu Pro Phe Glu Gly Thr Asn Ala Val Leu
 225 230 235 240
 Lys Thr Ser Ala Tyr Thr Ile Ser Val Asn
 245 250

<210> 20
 <211> 238
 <212> PRT

<213> Gliocladium roseum (1)

<400> 20

Met Lys Ala Asn Ile Val Ile Leu Ser Leu Phe Ala Pro Leu Ala Ala
1 5 10 15
Val Ala Gln Thr Leu Cys Gly Gln Tyr Ser Ser Asn Thr Gln Gly Gly
20 25 30
Tyr Ile Phe Asn Asn Asn Met Trp Gly Met Gly Ser Gly Ser Gly Ser
35 40 45
Gln Cys Thr Tyr Val Asp Lys Val Trp Ala Glu Gly Val Ala Trp His
50 55 60
Thr Asp Trp Ser Trp Ser Gly Gly Asp Asn Asn Val Lys Ser Tyr Pro
65 70 75 80
Tyr Ser Gly Arg Glu Leu Gly Thr Lys Arg Ile Val Ser Ser Ile Lys
85 90 95
Ser Ile Ser Ser Gly Ala Asp Trp Asp Tyr Thr Gly Ser Asn Leu Arg
100 105 110
Ala Asn Ala Ala Tyr Asp Ile Phe Thr Ser Ala Asn Pro Asn His Ala
115 120 125
Thr Ser Ser Gly Asp Tyr Glu Val Met Ile Trp Leu Ala Asn Leu Gly
130 135 140
Gly Leu Thr Pro Ile Gly Ser Pro Ile Gly Thr Val Lys Ala Ala Gly
145 150 155 160
Arg Asp Trp Glu Leu Trp Asp Gly Tyr Asn Gly Ala Met Arg Val Tyr
165 170 175
Ser Phe Val Ala Pro Ser Gln Leu Asn Ser Phe Asp Gly Glu Ile Met
180 185 190
Asp Phe Phe Tyr Val Val Lys Asp Met Arg Gly Phe Pro Ala Asp Ser
195 200 205
Gln His Leu Leu Thr Val Gln Phe Gly Thr Glu Pro Ile Ser Gly Ser
210 215 220
Gly Ala Lys Phe Ser Val Ser His Trp Ser Ala Lys Leu Gly
225 230 235

<210> 21

<211> 348

<212> PRT

<213> Gliocladium roseum (2)

<400> 21

Met Lys Ser Ile Ile Ser Phe Phe Gly Leu Ala Thr Leu Val Ala Ala
1 5 10 15
Ala Pro Ser Gln Asn Pro Thr Arg Thr Gln Pro Leu Glu Lys Arg Ala
20 25 30
Thr Thr Leu Cys Gly Gln Trp Asp Ser Val Glu Thr Gly Gly Tyr Thr
35 40 45
Ile Tyr Asn Asn Leu Trp Gly Gln Asp Asn Gly Ser Gly Ser Gln Cys
50 55 60
Leu Thr Val Glu Gly Val Thr Asp Gly Leu Ala Ala Trp Ser Ser Thr
65 70 75 80
Trp Ser Trp Ser Gly Gly Ser Ser Ser Val Lys Ser Tyr Ser Asn Ala
85 90 95
Val Leu Ser Ala Glu Ala Ala Arg Ile Ser Ala Ile Ser Ser Ile Pro
100 105 110
Ser Lys Trp Glu Trp Ser Tyr Thr Gly Thr Asp Ile Val Ala Asn Val
115 120 125
Ala Tyr Asp Leu Phe Ser Asn Thr Asp Cys Gly Asp Thr Pro Glu Tyr
130 135 140
Glu Ile Met Ile Trp Leu Ser Ala Leu Gly Gly Ala Gly Pro Ile Ser
145 150 155 160
Ser Thr Gly Ser Ser Ile Ala Thr Val Thr Ile Ala Gly Ala Ser Trp

				165					170				175				
Asn	Leu	Trp	Gln	Gly	Gln	Asn	Asn	Gln	Met	Ala	Val	Phe	Ser	Phe	Val		
			180					185					190				
Ala	Glu	Ser	Asp	Gln	Lys	Ser	Phe	Ser	Gly	Asp	Leu	Asn	Asp	Phe	Ile		
		195						200				205					
Gln	Tyr	Leu	Val	Asp	Ser	Gln	Gly	Tyr	Ser	Gly	Ser	Gln	Cys	Leu	Tyr		
	210					215					220						
Ser	Ile	Gly	Ala	Gly	Thr	Glu	Pro	Phe	Thr	Gly	Thr	Asp	Ala	Glu	Phe		
225					230					235				240			
Ile	Thr	Thr	Gly	Tyr	Ser	Val	Ser	Val	Ser	Ala	Gly	Asp	Ser	Gly	Cys		
			245						250					255			
Asp	Glu	Thr	Thr	Thr	Ser	Ser	Gln	Ala	Gln	Ser	Ser	Thr	Val	Glu	Thr		
		260						265					270				
Ser	Thr	Ala	Thr	Gln	Pro	Gln	Ser	Ser	Ser	Thr	Val	Val	Pro	Thr	Val		
	275						280					285					
Thr	Leu	Ser	Gln	Pro	Ser	Asn	Glu	Ser	Thr	Thr	Thr	Pro	Val	Gln	Ser		
	290					295					300						
Gln	Pro	Ser	Ser	Val	Glu	Thr	Thr	Pro	Thr	Ala	Gln	Pro	Gln	Ser	Ser		
305				310						315				320			
Ser	Val	Gln	Thr	Thr	Thr	Ala	Gln	Ala	Gln	Pro	Thr	Ser	Gly	Thr			
			325					330					335				
Gly	Cys	Ser	Arg	Arg	Arg	Lys	Arg	Arg	Ala	Val	Val						
		340					345										

<210> 22
 <211> 236
 <212> PRT
 <213> Gliocladium roseum (3)

<400> 22

Met	Lys	Phe	Gln	Leu	Leu	Ser	Leu	Thr	Ala	Phe	Ala	Pro	Leu	Ser	Leu		
1				5					10					15			
Ala	Ala	Leu	Cys	Gly	Gln	Tyr	Gln	Ser	Gln	Ser	Gln	Gly	Gly	Tyr	Ile		
			20					25					30				
Phe	Asn	Asn	Asn	Lys	Trp	Gly	Gln	Gly	Ser	Gly	Ser	Gly	Ser	Gln	Cys		
	35					40						45					
Leu	Thr	Ile	Asp	Lys	Thr	Trp	Asp	Ser	Asn	Val	Ala	Phe	His	Ala	Asp		
	50					55					60						
Trp	Ser	Trp	Ser	Gly	Gly	Thr	Asn	Asn	Val	Lys	Ser	Tyr	Pro	Asn	Ala		
65					70					75				80			
Gly	Leu	Glu	Phe	Ser	Arg	Gly	Lys	Lys	Val	Ser	Ser	Ile	Gly	Thr	Ile		
				85					90					95			
Asn	Gly	Gly	Ala	Asp	Trp	Asp	Tyr	Ser	Gly	Ser	Asn	Ile	Arg	Ala	Asn		
			100					105					110				
Val	Ala	Tyr	Gly	Ile	Phe	Thr	Ser	Ala	Asp	Pro	Asn	His	Val	Thr	Ser		
		115						120				125					
Ser	Gly	Asp	Tyr	Glu	Leu	Met	Ile	Trp	Leu	Gly	Lys	Leu	Gly	Asp	Ile		
	130					135					140						
Tyr	Pro	Ile	Gly	Asn	Ser	Ile	Gly	Arg	Val	Glu	Ala	Ala	Asn	Arg	Glu		
145					150					155				160			
Trp	Asp	Phe	Leu	Val	Gly	Tyr	Asn	Gly	Ala	Met	Lys	Val	Phe	Ser	Phe		
				165					170					175			
Val	Ala	Pro	Ser	Pro	Val	Thr	Leu	Phe	Asp	Gly	Asn	Ile	Met	Asp	Phe		
			180					185					190				
Phe	Tyr	Val	Met	Arg	Asp	Met	Gln	Gly	Tyr	Pro	Met	Asp	Lys	Gln	Tyr		
	195						200					205					
Leu	Leu	Ser	Leu	Gln	Phe	Gly	Thr	Glu	Pro	Phe	Thr	Gly	Ser	Asn	Ala		
	210					215					220						
Asn	Phe	Ser	Cys	Trp	Tyr	Phe	Gly	Ala	Lys	Ile	Lys						
225					230					235							

a!
 cont

<210> 23
 <211> 237
 <212> PRT
 <213> Gliocladium roseum (4)

<400> 23
 Met Lys Thr Gly Ile Ala Tyr Leu Ala Ala Val Leu Pro Leu Ala Met
 1 5 10 15
 Ala Glu Ser Leu Cys Asp Gln Tyr Ala Tyr Leu Ser Arg Asp Gly Tyr
 20 25 30
 Asn Phe Asn Asn Asn Glu Trp Gly Ala Ala Thr Gly Thr Gly Asp Gln
 35 40 45
 Cys Thr Tyr Val Asp Ser Thr Ser Ser Gly Gly Val Ser Trp His Ser
 50 55 60
 Asp Trp Thr Trp Ser Gly Ser Glu Ser Glu Ile Lys Ser Tyr Pro Tyr
 65 70 75 80
 Ser Gly Leu Asp Leu Pro Glu Lys Lys Ile Val Thr Ser Ile Gly Ser
 85 90 95
 Ile Ser Thr Gly Ala Glu Trp Ser Tyr Ser Gly Ser Asp Ile Arg Ala
 100 105 110
 Asp Val Ala Tyr Asp Thr Phe Thr Ala Ala Asp Pro Asn His Ala Thr
 115 120 125
 Ser Ser Gly Asp Tyr Glu Val Met Ile Trp Leu Ala Asn Leu Gly Gly
 130 135 140
 Leu Thr Pro Ile Gly Ser Pro Ile Gly Thr Val Lys Ala Ala Gly Arg
 145 150 155 160
 Asp Trp Glu Leu Trp Asp Gly Tyr Asn Gly Ala Met Arg Val Tyr Ser
 165 170 175
 Phe Val Ala Pro Ser Gln Leu Asn Ser Phe Asp Gly Glu Ile Met Asp
 180 185 190
 Phe Phe Tyr Val Val Lys Asp Met Arg Gly Phe Pro Ala Asp Ser Gln
 195 200 205
 His Leu Leu Thr Val Gln Phe Gly Thr Glu Pro Ile Ser Gly Ser Gly
 210 215 220
 Ala Lys Phe Ser Val Ser His Trp Ser Ala Lys Leu Gly
 225 230 235

<210> 24
 <211> 237
 <212> PRT
 <213> Memnoniella echinata

<400> 24
 Met Lys Val Ala Ala Leu Leu Val Ala Leu Ser Pro Leu Ala Phe Ala
 1 5 10 15
 Gln Ser Leu Cys Asp Gln Tyr Ser Tyr Tyr Ser Ser Asn Gly Tyr Glu
 20 25 30
 Phe Asn Asn Asn Met Trp Gly Arg Asn Ser Gly Gln Gly Asn Gln Cys
 35 40 45
 Thr Tyr Val Asp Tyr Ser Ser Pro Asn Gly Val Gly Trp Arg Val Asn
 50 55 60
 Trp Asn Trp Ser Gly Gly Asp Asn Asn Val Lys Ser Tyr Pro Tyr Ser
 65 70 75 80
 Gly Arg Gln Leu Pro Thr Lys Arg Ile Val Ser Trp Ile Gly Ser Leu
 85 90 95
 Pro Thr Thr Val Ser Trp Asn Tyr Gln Gly Asn Asn Leu Arg Ala Asn
 100 105 110
 Val Ala Tyr Asp Leu Phe Thr Ala Ala Asn Pro Asn His Pro Asn Ser
 115 120 125
 Ser Gly Asp Tyr Glu Leu Met Ile Trp Leu Gly Arg Leu Gly Asn Val
 130 135 140

Tyr Pro Ile Gly Asn Gln Val Ala Thr Val Asn Ile Ala Gly Gln Gln
 145 150 155 160
 Trp Asn Leu Tyr Tyr Gly Tyr Asn Gly Ala Met Gln Val Tyr Ser Phe
 165 170 175
 Val Ser Pro Asn Gln Leu Asn Tyr Phe Ser Gly Asn Val Lys Asp Phe
 180 185 190
 Phe Thr Tyr Leu Gln Tyr Asn Arg Ala Tyr Pro Ala Asp Ser Gln Tyr
 195 200 205
 Leu Ile Thr Tyr Gln Phe Gly Thr Glu Pro Phe Thr Gly Gln Asn Ala
 210 215 220
 Val Phe Thr Val Ser Asn Trp Ser Ala Gln Gln Asn Asn
 225 230 235

<210> 25
 <211> 245
 <212> PRT
 <213> Emericella desertoru

<400> 25
 Met Lys Leu Leu Ala Leu Ser Leu Val Ser Leu Ala Ser Ala Ala Ser
 1 5 10 15
 Ala Ala Ser Ile Leu Ser Asn Thr Phe Thr Arg Arg Ser Asp Phe Cys
 20 25 30
 Gly Gln Trp Asp Thr Ala Thr Val Gly Asn Phe Ile Val Tyr Asn Asn
 35 40 45
 Leu Trp Gly Gln Asp Asn Ala Asp Ser Gly Ser Gln Thr Gly Val Asp
 50 55 60
 Ser Ala Asn Gly Asn Ser Ile Ser Trp His Thr Thr Trp Ser Trp Ser
 65 70 75 80
 Gly Gly Ser Ser Ser Val Lys Ser Tyr Ala Asn Ala Ala Tyr Gln Phe
 85 90 95
 Thr Ser Thr Lys Leu Asn Ser Leu Ser Ser Ile Pro Thr Ser Trp Lys
 100 105 110
 Trp Gln Tyr Ser Thr Thr Asp Ile Val Ala Asn Val Ala Tyr Asp Leu
 115 120 125
 Phe Thr Ser Ser Ser Ala Gly Gly Asp Ser Glu Tyr Glu Ile Met Ile
 130 135 140
 Trp Leu Ala Ala Leu Gly Gly Ala Gly Pro Ile Ser Ser Thr Gly Ser
 145 150 155 160
 Ser Ile Ala Thr Val Thr Leu Gly Gly Val Thr Trp Ser Leu Tyr Ser
 165 170 175
 Gly Pro Asn Gly Ser Met Gln Val Tyr Ser Phe Val Ala Ser Ser Thr
 180 185 190
 Thr Glu Ser Phe Ser Ala Asp Leu Met Asp Phe Ile Asn Tyr Leu Ala
 195 200 205
 Glu Asn Gln Gly Leu Ser Ser Ser Gln Leu Thr His Val Gln Ala Gly
 210 215 220
 Thr Glu Pro Phe Thr Gly Thr Asp Ala Thr Leu Thr Val Ser Ser Tyr
 225 230 235 240
 Ser Val Ser Val Ser
 245

<210> 26
 <211> 371
 <212> PRT
 <213> Actinomycete sp. 11AG8

<400> 26
 Met Arg Ser His Pro Arg Ser Ala Thr Met Thr Val Leu Val Val Leu
 1 5 10 15
 Ala Ser Leu Gly Ala Leu Leu Thr Ala Ala Ala Pro Ala Gln Ala Asn

		20						25					30				
Gln	Gln	Ile	Cys	Asp	Arg	Tyr	Gly	Thr	Thr	Thr	Ile	Gln	Asp	Arg	Tyr		
		35					40					45					
Val	Val	Gln	Asn	Asn	Arg	Trp	Gly	Thr	Ser	Ala	Thr	Gln	Cys	Ile	Asn		
		50					55					60					
Val	Thr	Gly	Asn	Gly	Phe	Glu	Ile	Thr	Gln	Ala	Asp	Gly	Ser	Val	Pro		
65					70					75					80		
Thr	Asn	Gly	Ala	Pro	Lys	Ser	Tyr	Pro	Ser	Val	Tyr	Asp	Gly	Cys	His		
				85					90					95			
Tyr	Gly	Asn	Cys	Ala	Pro	Arg	Thr	Thr	Leu	Pro	Met	Arg	Ile	Ser	Ser		
			100					105					110				
Ile	Gly	Ser	Ala	Pro	Ser	Ser	Val	Ser	Tyr	Arg	Tyr	Thr	Gly	Asn	Gly		
		115						120				125					
Val	Tyr	Asn	Ala	Ala	Tyr	Asp	Ile	Trp	Leu	Asp	Pro	Thr	Pro	Arg	Thr		
		130				135					140						
Asn	Gly	Val	Asn	Arg	Thr	Glu	Ile	Met	Ile	Trp	Phe	Asn	Arg	Val	Gly		
145					150					155					160		
Pro	Val	Gln	Pro	Ile	Gly	Ser	Pro	Val	Gly	Thr	Ala	His	Val	Gly	Gly		
				165					170					175			
Arg	Ser	Trp	Glu	Val	Trp	Thr	Gly	Ser	Asn	Gly	Ser	Asn	Asp	Val	Ile		
			180					185					190				
Ser	Phe	Leu	Ala	Pro	Ser	Ala	Ile	Ser	Ser	Trp	Ser	Phe	Asp	Val	Lys		
		195					200					205					
Asp	Phe	Val	Asp	Gln	Ala	Val	Ser	His	Gly	Leu	Ala	Thr	Pro	Asp	Trp		
	210					215					220						
Tyr	Leu	Thr	Ser	Ile	Gln	Ala	Gly	Phe	Glu	Pro	Trp	Glu	Gly	Gly	Thr		
225					230					235					240		
Gly	Leu	Ala	Val	Asn	Ser	Phe	Ser	Ser	Ala	Val	Asn	Ala	Gly	Gly	Gly		
				245					250					255			
Asn	Gly	Gly	Thr	Pro	Gly	Thr	Pro	Ala	Ala	Cys	Gln	Val	Ser	Tyr	Ser		
			260					265					270				
Thr	His	Thr	Trp	Pro	Gly	Gly	Phe	Thr	Val	Asp	Thr	Thr	Ile	Thr	Asn		
		275					280						285				
Thr	Gly	Ser	Thr	Pro	Val	Asp	Gly	Trp	Glu	Leu	Asp	Phe	Thr	Leu	Pro		
	290					295					300						
Ala	Gly	His	Thr	Val	Thr	Ser	Ala	Trp	Asn	Ala	Leu	Ile	Ser	Pro	Ala		
305					310					315					320		
Ser	Gly	Ala	Val	Thr	Ala	Arg	Ser	Thr	Gly	Ser	Asn	Gly	Arg	Ile	Ala		
				325					330					335			
Ala	Asn	Gly	Gly	Thr	Gln	Ser	Phe	Gly	Phe	Gln	Gly	Thr	Ser	Ser	Gly		
			340					345					350				
Thr	Gly	Phe	Asn	Ala	Pro	Ala	Gly	Gly	Arg	Leu	Asn	Gly	Thr	Ser	Cys		
		355					360					365					
Thr	Val	Arg															
		370															

<210> 27
 <211> 381
 <212> PRT
 <213> Streptomyces lividans

<400> 27
 Met Arg Thr Leu Arg Pro Gln Ala Arg Ala Pro Arg Gly Leu Leu Ala
 1 5 10 15
 Ala Leu Gly Ala Val Leu Ala Ala Phe Ala Leu Val Ser Ser Leu Val
 20 25 30
 Thr Ala Ala Ala Pro Ala Gln Ala Asp Thr Thr Ile Cys Glu Pro Phe
 35 40 45
 Gly Thr Thr Thr Ile Gln Gly Arg Tyr Val Val Gln Asn Asn Arg Trp
 50 55 60
 Gly Ser Thr Ala Pro Gln Cys Val Thr Ala Thr Asp Thr Gly Phe Arg

65	Val	Thr	Gln	Ala	Asp	Gly	Ser	Ala	Pro	Thr	Asn	Gly	Ala	Pro	Lys	Ser
					85					90					95	
	Tyr	Pro	Ser	Val	Phe	Asn	Gly	Cys	His	Tyr	Thr	Asn	Cys	Ser	Pro	Gly
				100					105					110		
	Thr	Asp	Leu	Pro	Val	Arg	Leu	Asp	Thr	Val	Ser	Ala	Ala	Pro	Ser	Ser
				115				120					125			
	Ile	Ser	Tyr	Gly	Phe	Val	Asp	Gly	Ala	Val	Tyr	Asn	Ala	Ser	Tyr	Asp
				130				135					140			
	Ile	Trp	Leu	Asp	Pro	Thr	Ala	Arg	Thr	Asp	Gly	Val	Asn	Gln	Thr	Glu
145						150					155					160
	Ile	Met	Ile	Trp	Phe	Asn	Arg	Val	Gly	Pro	Ile	Gln	Pro	Ile	Gly	Ser
					165					170					175	
	Pro	Val	Gly	Thr	Ala	Ser	Val	Gly	Gly	Arg	Thr	Trp	Glu	Val	Trp	Ser
				180					185					190		
	Gly	Gly	Asn	Gly	Ser	Asn	Asp	Val	Leu	Ser	Phe	Val	Ala	Pro	Ser	Ala
			195					200					205			
	Ile	Ser	Gly	Trp	Ser	Phe	Asp	Val	Met	Asp	Phe	Val	Arg	Ala	Thr	Val
			210				215					220				
	Ala	Arg	Gly	Leu	Ala	Glu	Asn	Asp	Trp	Tyr	Leu	Thr	Ser	Val	Gln	Ala
225						230					235					240
	Gly	Phe	Glu	Pro	Trp	Gln	Asn	Gly	Ala	Gly	Leu	Ala	Val	Asn	Ser	Phe
					245					250					255	
	Ser	Ser	Thr	Val	Glu	Thr	Gly	Thr	Pro	Gly	Gly	Thr	Asp	Pro	Gly	Asp
				260					265					270		
	Pro	Gly	Gly	Pro	Ser	Ala	Cys	Ala	Val	Ser	Tyr	Gly	Thr	Asn	Val	Trp
			275					280					285			
	Gln	Asp	Gly	Phe	Thr	Ala	Asp	Val	Thr	Val	Thr	Asn	Thr	Gly	Thr	Ala
		290					295					300				
	Pro	Val	Asp	Gly	Trp	Gln	Leu	Ala	Phe	Thr	Leu	Pro	Ser	Gly	Gln	Arg
305						310					315					320
	Ile	Thr	Asn	Ala	Trp	Asn	Ala	Ser	Leu	Thr	Pro	Ser	Ser	Gly	Ser	Val
					325					330					335	
	Thr	Ala	Thr	Gly	Ala	Ser	His	Asn	Ala	Arg	Ile	Ala	Pro	Gly	Gly	Ser
				340					345					350		
	Leu	Ser	Phe	Gly	Phe	Gln	Gly	Thr	Tyr	Gly	Gly	Ala	Phe	Ala	Glu	Pro
			355					360					365			
	Thr	Gly	Phe	Arg	Leu	Asn	Gly	Thr	Ala	Cys	Thr	Thr	Val			
		370					375					380				

<210> 28
 <211> 260
 <212> PRT
 <213> Rhodothermus marinus

<400> 28
 Met Asn Val Met Arg Ala Val Leu Val Leu Ser Leu Leu Leu Leu Phe
 1 5 10 15
 Gly Cys Asp Trp Leu Phe Pro Asp Gly Asp Asn Gly Lys Glu Pro Glu
 20 25 30
 Pro Glu Pro Glu Pro Thr Val Glu Leu Cys Gly Arg Trp Asp Ala Arg
 35 40 45
 Asp Val Ala Gly Gly Arg Tyr Arg Val Ile Asn Asn Val Trp Gly Ala
 50 55 60
 Glu Thr Ala Gln Cys Ile Glu Val Gly Leu Glu Thr Gly Asn Phe Thr
 65 70 75 80
 Ile Thr Arg Ala Asp His Asp Asn Gly Asn Asn Val Ala Ala Tyr Pro
 85 90 95
 Ala Ile Tyr Phe Gly Cys His Trp Ala Pro Ala Arg Ala Ile Arg Asp
 100 105 110
 Cys Ala Ala Arg Ala Gly Ala Val Arg Arg Ala His Glu Leu Asp Val


```
<210> 29
<211> 264
<212> PRT
<213> Erwinia carotovara
```

a!
cont

<210> 30
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 9
<223> n = A,T,C or G

<400> 30
aayaayytnt gggg

14

<210> 31
<211> 14
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 9
<223> n = A,T,C or G

<400> 31
caraayytnt gggg

14

<210> 32
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 12
<223> n = inosine

<400> 32
aayaayaayh wntgggg

17

<210> 33
<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 6
<223> n = A,T,C or G

<400> 33
garytnatga thtgg

15

<210> 34

<211> 15
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 10
<223> n = A,T,C or G

<400> 34
ccadatcatn arytc

15

<210> 35
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 9
<223> n = inosine

<400> 35
taygarytna tgathtgg

18

<210> 36
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 10
<223> n = inosine

<400> 36
ccadatcatn arytcrt

18

<210> 37
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 6
<223> n = A,T,C or G

<400> 37
gtraanggyt crgtrcc

17

<210> 38
<211> 17

<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 6
<223> n = A,T,C or G

<400> 38
gtraanggyt crgtycc

17

<210> 39
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 6
<223> n = A,T,C or G

<400> 39
gtraanggyt cygtrcc

17

<210> 40
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 6
<223> n = A,T,C or G

<400> 40
gtraanggyt cygtycc

17

<210> 41
<211> 17
<212> DNA
<213> Artificial Sequence

<220>
<223> primer

<221> misc_feature
<222> 12, 15
<223> n = A,T,C or G

<400> 41
gtraarcayt cngtncc

17

<210> 42
<211> 5
<212> PRT

a!
cont

<213> Artificial Sequence

<220>

<223> synthetic

<221> VARIANT

<222> 1

<223> Xaa = Ser, Tyr, Cys, Trp, Thr, Asn, Lys, or Arg

<221> VARIANT

<222> 2

<223> Xaa = Val or Pro

<221> VARIANT

<222> 3

<223> Xaa = Lys or Ala

<221> VARIANT

<222> 4

<223> Xaa = Ser or Ala

<221> VARIANT

<222> 5

<223> Xaa = Tyr or Phe

<400> 42

Xaa Xaa Xaa Xaa Xaa

1

5

<210> 43

<211> 102

<212> PRT

<213> Trichoderma reesei

<400> 43

Asn Asn Leu Trp Gly Ala Ser Ala Gly Ser Gly Phe Gly Cys Val Thr
1 5 10 15
Ala Val Ser Leu Ser Gly Gly Ala Ser Trp His Ala Asp Trp Gln Trp
20 25 30
Ser Gly Gly Gln Asn Asn Val Lys Ser Tyr Gln Asn Ser Gln Ile Ala
35 40 45
Ile Pro Gln Lys Arg Thr Val Asn Ser Ile Ser Ser Met Pro Thr Thr
50 55 60
Ala Ser Trp Ser Tyr Ser Gly Ser Asn Ile Arg Ala Asn Val Ala Tyr
65 70 75 80
Asp Leu Phe Thr Ala Ala Asn Pro Asn His Val Thr Tyr Ser Gly Asp
85 90 95
Tyr Glu Leu Met Ile Trp
100

<210> 44

<211> 104

<212> PRT

<213> Fusarium equiseti

<400> 44

Asn Asn Phe Trp Gly Lys Asp Ser Gly Thr Gly Asp Gln Cys Thr His
1 5 10 15
Val Asn Trp Asn Asn Ala Asn Gly Ala Gly Trp Asp Val Glu Trp Asn
20 25 30
Trp Ser Gly Gly Lys Asp Asn Val Lys Ser Tyr Pro Asn Ser Ala Leu

35 40 45
 Leu Ile Gly Glu Asp Lys Lys Thr Ile Ser Ser Ile Thr Asn Met Gln
 50 55 60
 Ser Thr Ala Glu Trp Lys Tyr Ser Gly Asp Asn Leu Arg Ala Asp Val
 65 70 75 80
 Ala Tyr Asp Leu Phe Thr Ala Ala Asp Pro Asn His Glu Thr Ser Ser
 85 90 95
 Gly Glu Tyr Glu Leu Met Ile Trp
 100

<210> 45
 <211> 103
 <212> PRT
 <213> Gliocladium roseum

<400> 45
 Asn Asn Lys Trp Gly Gln Gly Ser Gly Ser Gly Ser Gln Cys Leu Thr
 1 5 10 15
 Ile Asp Lys Thr Trp Asp Ser Asn Val Ala Phe His Ala Asp Trp Ser
 20 25 30
 Trp Ser Gly Gly Thr Asn Asn Val Lys Ser Tyr Pro Lys Arg Arg Ser
 35 40 45
 Glu Phe Ser Arg Gly Lys Lys Val Ser Ser Ile Gly Thr Ile Asn Gly
 50 55 60
 Gly Ala Asp Trp Asp Tyr Ser Gly Ser Asn Ile Arg Ala Asn Val Ala
 65 70 75 80
 Tyr Gly Ile Phe Thr Ser Ala Asp Pro Asn His Val Thr Ser Ser Gly
 85 90 95
 Asp Tyr Glu Leu Met Ile Trp
 100

<210> 46
 <211> 89
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> hypothetical Acremonium brachypenium peptide
 without intron

<400> 46
 Trp Gly Pro Arg Ser Ala Glu Ser Gly Glu Gln Cys Thr Thr Asn Asn
 1 5 10 15
 Gly Leu Ser Asp Asp Gly Thr Leu Ser Trp Ser Val Glu Trp Thr Trp
 20 25 30
 Val Gly Ala Pro Ser Ser Val Lys Ser Tyr Pro Asn Val Phe Val Glu
 35 40 45
 Ala Glu Pro Arg Pro Leu Ser Glu Val Ser Ser Ile Gln Ala Glu Trp
 50 55 60
 Ala Trp Thr Tyr Ser Gly Ala Gly Asp Phe Thr Thr Asn Val Ala Phe
 65 70 75 80
 Asp Ile Phe Thr Gly Glu Thr Ala Asp
 85

<210> 47
 <211> 102
 <212> PRT
 <213> Aspergillus kawachii (1)

<400> 47
 Gln Asn Leu Trp Gly Glu Tyr Gln Gly Thr Gly Ser Gln Cys Val Tyr

1	5	10	15
Val Asp Lys	Leu Ser Ser Ser Gly	Ala Ser Trp His Thr	Lys Trp Thr
	20	25	30
Trp Ser Gly	Gly Glu Gly Thr	Val Lys Ser Tyr Ser	Asn Ser Gly Leu
	35	40	45
Thr Phe Asp	Lys Lys Leu Val	Ser Asp Val Ser Ser	Ile Pro Thr Ser
	50	55	60
Val Thr Trp	Ser Gln Asp Asp Thr	Asn Val Gln Ala Asp	Val Ser Tyr
65	70	75	80
Asp Leu Phe	Thr Ala Ala Asn Ala	Asp His Ala Thr Ser	Ser Gly Asp
	85	90	95
Tyr Glu Leu	Met Ile Trp		
	100		

<210> 48
 <211> 102
 <212> PRT
 <213> *Aspergillus aculeatus*

<400> 48
Asn Asn Leu Trp Gly Lys Asp Ala Gly Ser Gly Ser Gln Cys Thr Thr
1 5 10 15
Val Asn Ser Ala Ser Ser Ala Gly Thr Ser Trp Ser Thr Lys Trp Asn
20 25 30
Trp Ser Gly Gly Glu Asn Ser Val Lys Ser Tyr Ala Asn Ser Gly Leu
35 40 45
Thr Phe Asn Lys Lys Leu Val Ser Gln Ile Ser Gln Ile Pro Thr Thr
50 55 60
Ala Arg Trp Ser Tyr Asp Asn Thr Gly Ile Arg Ala Asp Val Ala Tyr
65 70 75 80
Asp Leu Phe Thr Ala Ala Asp Ile Asn His Val Thr Trp Ser Gly Asp
85 90 95
Tyr Glu Leu Met Ile Trp
100

<210> 49
 <211> 104
 <212> PRT
 <213> *Humicola insolens*

<400> 49
Asn Asn Leu Trp Gly Lys Asp Thr Ala Thr Ser Gly Trp Gln Cys Thr
1 5 10 15
Tyr Leu Asp Gly Thr Asn Asn Gly Gly Ile Gln Trp Ser Thr Ala Trp
20 25 30
Glu Trp Gln Gly Ala Pro Asp Asn Val Lys Ser Tyr Pro Tyr Val Gly
35 40 45
Lys Gln Ile Gln Arg Gly Arg Lys Ile Ser Asp Ile Asn Ser Met Arg
50 55 60
Thr Ser Val Ser Trp Thr Tyr Asp Arg Thr Asp Ile Arg Ala Asn Val
65 70 75 80
Ala Tyr Asp Val Phe Thr Ala Arg Asp Pro Asp His Pro Asn Trp Gly
85 90 95
Gly Asp Tyr Glu Leu Met Ile Trp
100

<210> 50
 <211> 104
 <212> PRT
 <213> *Actinomycte sp.11AG8*

<400> 50
 Asn Asn Arg Trp Gly Thr Ser Ala Thr Gln Cys Ile Asn Val Thr Gly
 1 5 10 15
 Asn Gly Phe Glu Ile Thr Gln Ala Asp Gly Ser Val Pro Thr Asn Gly
 20 25 30
 Ala Pro Lys Ser Tyr Pro Ser Val Tyr Asp Gly Cys His Tyr Gly Asn
 35 40 45
 Cys Ala Pro Arg Thr Thr Leu Pro Met Arg Ile Ser Ser Ile Gly Ser
 50 55 60
 Ala Pro Ser Ser Val Ser Tyr Arg Tyr Thr Gly Asn Gly Val Tyr Asn
 65 70 75 80
 Ala Ala Tyr Asp Ile Trp Leu Asp Pro Thr Pro Arg Thr Asn Gly Val
 85 90 95
 Asn Arg Thr Glu Ile Met Ile Trp
 100

<210> 51
 <211> 110
 <212> PRT
 <213> Erwinia carotovara

<400> 51
 Asn Asn Val Trp Gly Lys Asp Glu Ile Lys Gly Trp Gln Gln Thr Ile
 1 5 10 15
 Phe Tyr Asn Ser Pro Ile Ser Met Gly Trp Asn Trp His Trp Pro Ser
 20 25 30
 Ser Thr His Ser Val Lys Ala Tyr Pro Ser Leu Val Ser Gly Trp His
 35 40 45
 Trp Thr Ala Gly Tyr Thr Glu Asn Ser Gly Leu Pro Ile Gln Leu Ser
 50 55 60
 Ser Asn Lys Ser Ile Thr Ser Asn Val Thr Tyr Ser Ile Lys Ala Thr
 65 70 75 80
 Gly Thr Tyr Asn Ala Ala Tyr Asp Ile Trp Phe His Thr Thr Asp Lys
 85 90 95
 Ala Asn Trp Asp Ser Ser Pro Thr Asp Glu Leu Met Ile Trp
 100 105 110

<210> 52
 <211> 103
 <212> PRT
 <213> Gliocladium roseum

a!
 Cont
 <400> 52
 Asn Asn Leu Trp Gly Met Gly Ser Gly Ser Gly Ser Gln Cys Thr Tyr
 1 5 10 15
 Val Asp Lys Val Trp Ala Glu Gly Val Ala Trp His Thr Asp Trp Ser
 20 25 30
 Trp Ser Gly Gly Asp Asn Asn Val Lys Ser Tyr Pro Tyr Ser Gly Arg
 35 40 45
 Glu Leu Gly Thr Lys Arg Ile Val Ser Ser Ile Lys Ser Ile Ser Ser
 50 55 60
 Gly Ala Asp Trp Asp Tyr Thr Gly Ser Asn Leu Arg Ala Asn Ala Ala
 65 70 75 80
 Tyr Asp Ile Phe Thr Ser Ala Asn Pro Asn His Ala Thr Ser Ser Gly
 85 90 95
 Asp Tyr Glu Leu Met Ile Trp
 100

<210> 53
 <211> 100
 <212> PRT

<213> Artificial Sequence

<220>

<223> hypothetical Gliocladium roseum peptide without
intron

<400> 53

```
Asn Asn Leu Trp Gly Gln Asp Asn Gly Ser Gly Ser Gln Cys Leu Thr
 1          5          10          15
Val Glu Gly Val Thr Asp Gly Leu Ala Trp Ser Ser Thr Trp Ser
      20          25          30
Trp Ser Gly Gly Ser Ser Ser Val Lys Ser Tyr Ser Asn Ala Val Leu
      35          40          45
Ser Ala Glu Ala Ala Arg Ile Ser Ala Ile Ser Ser Ile Pro Ser Lys
      50          55          60
Trp Glu Trp Arg Ser Tyr Thr Gly Thr Asp Ile Val Ala Asn Val Ala
65          70          75          80
Tyr Asp Leu Phe Ser Asn Thr Asp Cys Gly Asp Thr Pro Glu Tyr Glu
      85          90          95
Leu Met Ile Trp
      100
```

<210> 54

<211> 104

<212> PRT

<213> Humicola grisea

<400> 54

```
Asn Asn Leu Trp Gly Gln Asp Thr Ala Thr Ser Gly Trp Gln Cys Thr
 1          5          10          15
Tyr Leu Asp Gly Thr Asn Asn Gly Gly Ile Gln Trp Ser Thr Ala Trp
      20          25          30
Glu Trp Gln Gly Ala Pro Asp Asn Val Lys Ser Tyr Pro Tyr Val Gly
      35          40          45
Lys Gln Ile Gln Arg Gly Arg Lys Ile Ser Asp Ile Asn Ser Met Arg
      50          55          60
Thr Ser Val Ser Trp Thr Tyr Asp Arg Thr Asp Ile Arg Ala Asn Val
65          70          75          80
Ala Tyr Asp Val Phe Thr Ala Arg Asp Pro Asp His Pro Asn Trp Gly
      85          90          95
Gly Asp Tyr Glu Phe Met Ile Trp
      100
```

<210> 55

<211> 105

<212> PRT

<213> Rhodothermus marinus

<400> 55

```
Asn Asn Val Trp Gly Ala Glu Thr Ala Gln Cys Ile Glu Val Gly Leu
 1          5          10          15
Glu Thr Gly Asn Phe Thr Ile Thr Arg Ala Asp His Asp Asn Gly Asn
      20          25          30
Asn Val Ala Ala Tyr Pro Ala Ile Tyr Phe Gly Cys His Trp Ala Pro
      35          40          45
Ala Arg Ala Ile Arg Asp Cys Ala Ala Arg Ala Gly Ala Val Arg Arg
      50          55          60
Ala His Glu Leu Asp Val Thr Pro Ile Thr Thr Gly Arg Trp Asn Ala
65          70          75          80
Ala Tyr Asp Ile Trp Phe Ser Pro Val Thr Asn Ser Gly Asn Gly Tyr
      85          90          95
```

Ser Gly Gly Ala Glu Leu Met Ile Trp
 100 105

<210> 56
 <211> 104
 <212> PRT
 <213> Streptomyces lividans

<400> 56
 Asn Asn Arg Trp Gly Ser Thr Ala Pro Gln Cys Val Thr Ala Thr Asp
 1 5 10 15
 Thr Gly Phe Arg Val Thr Gln Ala Asp Gly Ser Ala Pro Thr Asn Gly
 20 25 30
 Ala Pro Lys Ser Tyr Pro Ser Val Phe Asn Gly Cys His Tyr Thr Asn
 35 40 45
 Cys Ser Pro Gly Thr Asp Leu Pro Val Arg Leu Asp Thr Val Ser Ala
 50 55 60
 Ala Pro Ser Ser Ile Ser Tyr Gly Phe Val Asp Gly Ala Val Tyr Asn
 65 70 75 80
 Ala Ser Tyr Asp Ile Trp Leu Asp Pro Thr Ala Arg Thr Asp Gly Val
 85 90 95
 Asn Gln Thr Glu Ile Met Ile Trp
 100

<210> 57
 <211> 96
 <212> PRT
 <213> Penicillium notatum

<400> 57
 Trp Gly Lys Asp Ser Gly Ser Gly Ser Gln Cys Ala Ser Val Asn Ser
 1 5 10 15
 Ile Ser Asp Ser Gly Val Ser Trp Ser Thr Thr Trp Asn Trp Ser Gly
 20 25 30
 Gly Glu Asp Asn Val Lys Ser Tyr Pro Asn Ser Gly Leu Val Ala Leu
 35 40 45
 Lys Lys Gln Pro Val Ser Asp Ile Ser Ser Ile Pro Ser Ser Val Lys
 50 55 60
 Trp Asn Tyr Asp Asn Thr Asp Ile Arg Ala Asp Val Ala Tyr Asp Leu
 65 70 75 80
 Phe Thr Ala Ala Asp Ile Asn His Asp Thr Ser Ser Gly Asp Tyr Glu
 85 90 95

<210> 58
 <211> 87
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> hypothetical Phanerochaete chrysosporium peptide
 without intron

<400> 58
 Trp Gly Lys Asp Ser Gly Thr Gly Ser Gln Cys Leu Thr Val Asp Gly
 1 5 10 15
 Ile Ser Ser Gly Leu Leu Lys Trp Ser Ala Thr Trp Ser Trp Ser Gly
 20 25 30
 Gly Pro Tyr Asn Val Lys Ser Tyr Pro Asn Ala Val Leu Gln Ala Pro
 35 40 45
 Ala Ala Arg Ala Ser Ala Ile Ser Ser Ile Pro Ser Lys Trp Gln Trp
 50 55 60

Glu Ser Tyr Thr Gly Ser Asn Val Ile Ala Asn Val Ala Tyr Asp Leu
 65 70 75 80
 Phe Ser Asn Ser Asp Cys Gly
 85

<210> 59
 <211> 84
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> hypothetical F42 peptide without intron

<400> 59
 Ser Gln Cys Thr Thr Phe Glu Ser Leu Ser Gly Asn Thr Ile Val Trp
 1 5 10 15
 Asn Thr Lys Trp Ser Trp Ser Gly Gly Gln Gly Val Lys Ser Phe
 20 25 30
 Ala Asn Ala Ala Leu Gln Phe Thr Pro Lys Lys Leu Ser Ser Val Lys
 35 40 45
 Ser Ile Asp Ser Thr Trp Lys Trp Lys Ser Tyr Ser Gly Ser Asn Ile
 50 55 60
 Val Ala Asp Val Ala Tyr Asp Met Phe Leu Ser Thr Ser Pro Gly Gly
 65 70 75 80
 Asp His Asn Tyr

<210> 60
 <211> 100
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> hypothetical Emericella desertoru peptide without intron

<221> VARIANT
 <222> 6
 <223> Xaa = Any Amino Acid

<400> 60
 Asn Asn Leu Trp Gly Xaa Asp Asn Ala Asp Ser Gly Ser Gln Cys Thr
 1 5 10 15
 Gly Val Asp Ser Ala Asn Gly Asn Ser Ile Ser Trp His Thr Thr Trp
 20 25 30
 Ser Trp Ser Gly Gly Ser Ser Ser Val Lys Ser Tyr Ala Asn Ala Ala
 35 40 45
 Tyr Gln Phe Thr Ser Thr Lys Leu Asn Ser Leu Ser Ser Ile Pro Thr
 50 55 60
 Ser Trp Lys Trp Gln Tyr Ser Thr Thr Asp Ile Val Ala Asn Val Ala
 65 70 75 80
 Tyr Asp Leu Phe Thr Ser Ser Ser Ala Gly Gly Asp Ser Glu Tyr Glu
 85 90 95
 Phe Met Ile Trp
 100

<210> 61
 <211> 27
 <212> PRT
 <213> Myceliophthora thermophilia

<400> 61
 Ala Asn Val Ala Tyr Asp Leu Phe Thr Ala Ala Asp Pro Asn His Ala
 1 5 10 15
 Thr Ser Ser Gly Asp Tyr Glu Leu Met Ile Trp
 20 25

<210> 62
 <211> 104
 <212> PRT
 <213> Chaetomium brasilliense

<400> 62
 Asn Asn Phe Trp Gly Gln Ser Arg Ala Thr Ser Gly Ser Gln Cys Thr
 1 5 10 15
 Tyr Leu Asp Ser Ser Ser Asn Ser Gly Ile His Trp His Thr Thr Trp
 20 25 30
 Thr Trp Glu Gly Gly Glu Gly Glu Val Lys Ser Tyr Ala Tyr Ser Gly
 35 40 45
 Arg Gln Val Ser Thr Gly Leu Thr Ile Ala Ser Ile Asp Ser Met Gln
 50 55 60
 Thr Ser Val Ser Trp Glu Tyr Asn Thr Thr Asp Ile Gln Ala Asn Val
 65 70 75 80
 Ala Tyr Asp Ile Phe Thr Ala Glu Asp Pro Asp His Glu His Ser Ser
 85 90 95
 Gly Asp Tyr Glu Leu Met Ile Trp
 100

<210> 63
 <211> 102
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> EGI III consensus sequence

<400> 63
 Asn Asn Leu Trp Gly Lys Asp Ser Gly Gly Ser Gln Cys Thr Thr Val
 1 5 10 15
 Asp Ser Leu Ser Asp Gly Gly Ile Ser Trp Ser Thr Ala Trp Ser Trp
 20 25 30
 Ser Gly Gly Glu Gly Asn Val Lys Ser Tyr Pro Asn Ser Gly Leu Gln
 35 40 45
 Phe Ser Ala Gly Lys Lys Val Ser Ser Ile Ser Ser Ile Pro Ser Ser
 50 55 60
 Ala Ser Trp Val Tyr Ser Gly Thr Asp Ile Arg Ala Asn Val Ala Tyr
 65 70 75 80
 Asp Leu Phe Thr Ala Ala Asp Pro Asn His Ala Thr Ser Ser Gly Asp
 85 90 95
 Tyr Glu Leu Met Ile Trp
 100

<210> 64
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> BOX 1 peptide

<221> VARIANT
 <222> 1

<223> Xaa = Asn or Gln

<400> 64

Xaa Asn Leu Trp Gly
1 5

<210> 65

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> BOX 1' peptide

<221> VARIANT

<222> 4

<223> Xaa = Phe, Leu, Tyr, Ile, Leu, Asn, or Lys

<400> 65

Asn Asn Asn Xaa Trp Gly
1 5

<210> 66

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> BOX 2 peptide

<400> 66

Glu Leu Met Ile Trp
1 5

<210> 67

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> BOX 2' peptide

<400> 67

Tyr Glu Leu Met Ile Trp
1 5

<210> 68

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> BOX 3 peptide

<221> VARIANT

<222> 4

<223> Xaa = Pro or Cys

<400> 68

Gly Thr Glu Xaa Phe Thr
1 5